

- 30 -

CLAIMS

1. A responsive load device adapted to be connected to an electric load which consumes intermittent or variable electric energy, the apparatus comprising:

means for receiving an input indicative of the frequency of the mains power supplied to the load from a grid; and

means responsive thereto to determine a level of stress under which the grid is operating and to control power consumption by said load in accordance with the determined stress level and to prevent adjustment of the power consumption when the stress level exceeds a predetermined maximum threshold value and/or falls below a predetermined minimum threshold value.

2. The device of claim 1, wherein the device is responsive to said frequency to prevent the power consumption of the load being increased when a generation shortage grid stress level exceeds a first maximum threshold value and/or being decreased when a demand shortage grid stress level is below a first minimum threshold value.

3. The device of claim 2, wherein the device is responsive to the system generation shortage grid stress level exceeding a second maximum threshold value, higher than the first, to prevent the load consuming power.

4. The device of claim 2 or 3, wherein the device is responsive to the demand shortage grid stress level being below a second minimum threshold value, lower than the first, to increase the power consumption of the load to a maximum.

35 5. The device of any preceding claim, further comprising:

- 31 -

responsive load control apparatus adapted to be connected to the electric load which consumes intermittent or variable electric energy in order to maintain a variable within controlled limits;

5 means for controlling the power consumed by the load in response to the frequency of the mains power supplied to the system and the value of said variable;

means for detecting the frequency of mains power supplied to the electric load and means for detecting
10 the value of the variable of said load;

means for determining the level of instantaneous stress on the grid based on the detected frequency;

and wherein said means for controlling the power consumed comprises:

15 means for comparing the detected instantaneous stress level with predetermined upper and lower instantaneous stress level thresholds,

means for comparing said variable with predetermined upper and lower thresholds,

20 means for switching off or reducing power supply to the load when said system instantaneous stress level drops below said lower instantaneous stress level limit and said variable is within the range defined by the upper and lower thresholds, and

25 means for switching on or increasing power supplied to the load when said instantaneous stress level is above the upper instantaneous stress level limit and said variable is within the range defined by the upper and lower thresholds; and further comprising:

30 means adapted to automatically optimise or adjust the predetermined threshold values.

6. A method for controlling an electric load which receives electrical power from a grid, said method comprising the steps of:

determining a stress level of the grid from a frequency of the electrical power received by the

- 32 -

electric load;

5 preventing adjustment of the power consumed by the electric load when the determined stress level exceeds a predetermined maximum threshold and/or falls below a predetermined minimum threshold.

7. The method of claim 6, wherein the preventing step comprises:

10 preventing an increase of the power consumed when the determined stress level exceeds the predetermined maximum threshold and preventing a decrease of the power consumed when the determined stress level falls below the predetermined minimum threshold.

15 8. The method of claim 7, further comprising the step of:

preventing the electric load from consuming power when the stress level of the grid exceeds a second maximum threshold, greater than the first.

20 9. The method of claim 7 or 8, further comprising the step of:

maximising the power consumed by the electric load when the determined stress level of the grid falls below a second minimum threshold, less than the first.